



SAFE BULK HANDLING OF DIATOMACEOUS EARTH



TETRA Technologies, Inc. is a geographically diversified oil and gas services company that provides niche products and services focused on well completion and on late-life production enhancement and decommissioning. In addition, it is the world's largest, vertically integrated producer, marketer, and distributor of calcium chloride, which it supplies as feedstocks — along with its brominated products — for its completion fluids business and for applications in a variety of other markets. TETRA holds premier market positions in several niche oil and gas service market categories.

One of TETRA's core product lines is plate and frame diatomaceous earth (DE) filtration systems, which are used to filter clear brine fluids, chemicals, and produced water in completion, stimulation, and workover operations.

TETRA prides itself on having a proactive, rigorous and responsible health, safety and environmental (HSE) program and aggressively pursues operational and environmental enhancements in the spirit of continuous improvement. Given this mindset, the Company saw an opportunity to introduce a new automated DE bulk handling system to replace the labor intensive process of having a man in multi-layered



Offshore Filtration Operation



MATCON IBC & CONE VALVE Discharge Station integrated into TETRA's SafeDEflo automated DE delivery system

overalls and gloves (often in extremely hot conditions) haul 50-pound sacks of DE to a filter inlet, use a knife to open the bags, and empty the contents into the filter. Believing that this process could be improved on and automated for enhanced safety and accuracy, TETRA researched the available technology and turned to MATCON for a solution.

TETRA outlined the system's requirements:

- The system must operate with total reliability under extremely harsh conditions.
- The system must provide guaranteed discharge of DE material from the IBCs.
- The system must satisfy the extremely strict safety standards set by the oil and gas industry so that it can be applied globally.
- The system must reduce waste generation and disposal (i.e., sacks, shrinkwrap, and pallets).
- The system must eliminate discharge of airborne DE material into the environment.
- The system must reduce the probability for back and hand injuries.

To meet these requirements, TETRA integrated the MATCON CONE VALVE IBC (Intermediate Bulk Container) system. The unique MATCON CONE VALVE operates pneumatically to lift and vibrate the IBC contents, discharging it rapidly and safely without operator intervention. The action of the CONE VALVE prevents rat holing, bridging, and segregation problems commonly associated with conventional butterfly and slide valves.



TETRA's new SafeDEflo automated DE delivery system

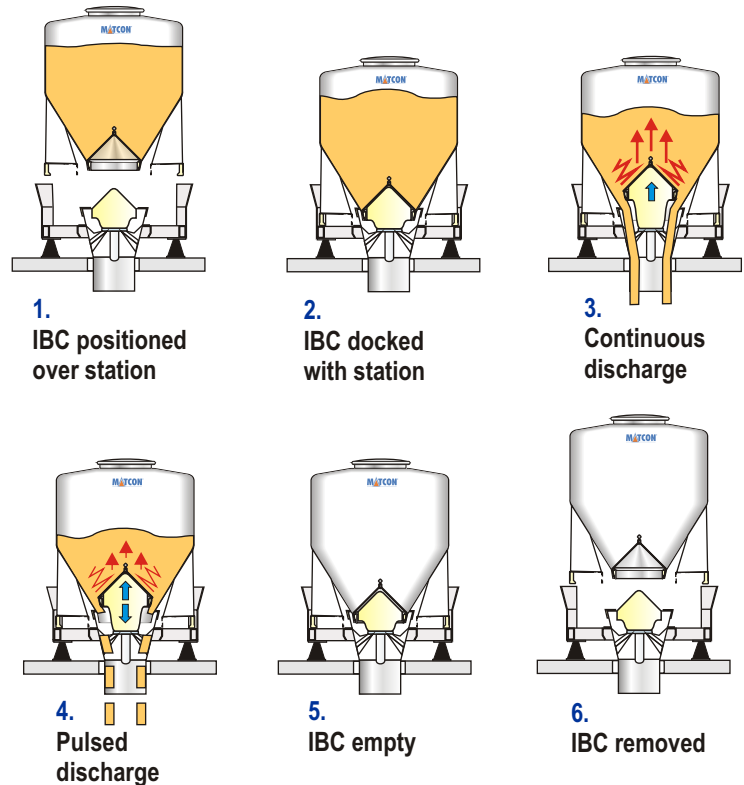
CASE STUDY

TETRA calls this system the SafeDEflo™ automated DE delivery system. The new technology facilitates the quick and safe handling of filtration media by pairing preloaded filter media containers with an automated dispensing system and control panel. The system is transported to a job site. A typical package includes the stackable control unit and six preloaded IBCs — two containing medium and four containing fine particle size filter media. Each IBC holds 1,000 pounds of filter media.

The SafeDEflo automated DE delivery system offers many safety and environmental advantages including:

- **Environmentally Friendly:** Generating no waste and very little dust.
- **Safety Enhancing:** Eliminating the need for filtration and rig personnel to cut, lift, and load 50-pound bags of filter media.
- **Waste Reducing:** Eliminating the need to dispose of empty sacks, shrinkwrap, and pallets, another key financial and environmental advantage.
- **Accurate Dispensing:** Ensuring accurate and controlled dispensing of 2,000 pounds of filter media through the pneumatic control panel.

PRINCIPLES OF OPERATION



Together, the dispensing system and control panel accurately regulate the amount of DE material being added to TETRA's SafeDEflo plate and frame filtration systems.

The new automated DE delivery system has now been applied offshore

in the Gulf of Mexico and is a tremendous success. MATCON is very pleased to join TETRA in its ongoing goal of improving processes and enhancing the safety of workers and the environment.



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From IBCs to Turnkey Solutions